U.S. Department of Energy
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Brightfields℠

Redeveloping Brownfields with Solar Energy

What is Brightfields?

Tools for Brightfields Partners

Brightfields Activities

Incorporating solar and other renewable energy technologies into the reuse of industrial properties makes economic and environmental sense. This effort can serve as a national, even international model for the kind of development that promotes livable communities.

Brightfields Grants Announced for:
Massachusetts
New Jersey
Washington

Press Releases, Announcements, and Speeches

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New Brightfields Feasibility Study Released
Check out the study

What is Brightfields[CM]?

What is a Brightfield[CM]?

A Brightfield[CM] is an abandoned or contaminated property ("brownfield") that is redeveloped through the incorporation of solar energy. The Department of Energy's revolutionary Brightfields[CM] concept addresses economic development, environmental cleanup, and air quality challenges by bringing pollution-free solar energy and high-tech solar manufacturing jobs to brownfield sites.

Brightfields[CM] is flexible and rapidly growing. It is designed to support a broad array of solar projects. Some examples of current projects include the placement of a solar energy manufacturing plant, building-integrated solar energy systems, and solar electric systems on brownfield sites.

Why use solar energy technologies?
Solar energy technologies, and photovoltaic systems in particular, are well-suited for use on brownfields sites. They require very little maintenance and can stand directly on the ground without penetrating the surface or disturbing any existing contamination. The systems can be installed to function on or off the local power grid, depending upon the needs of the site and existing infrastructure, and will not add pollution to the environment.

Each Brightfield[CM] will vary in terms of the use of solar energy systems-power generation, solar manufacturing, solar lighting-according to the size of the site, redevelopment plans, and market conditions, among other factors.

What is a Brownfield?

A brownfield is an abandoned, idled, or under-used industrial and commercial site where expansion or redevelopment is complicated by real or perceived environmental

contamination (such as a landfill or Superfund site); it also has an active potential for redevelopment or reuse.

For more information, please go to: http://www.epa.gov/brownfields/

What is Brightfields[CM], and why is it important?

In an effort to encourage productive use of brownfields, revitalize communities, and advance the use of clean and climate-friendly energy technologies, the Department of Energy is working with local governments and industry to link solar energy technologies to brownfields redevelopment through Brightfields[CM].

Brightfields[CM] solutions to brownfields redevelopment can help communities to maximize the value of their brownfields sites by converting their economic burdens into revenue-generating assets.

How can Brightfields[CM] promote sustainable economic development throughout the U.S.?

- Brightfields[CM] can support sustained economic growth by providing a commercially viable renewable energy resource to local communities.
- Brightfields[CM] projects are market-oriented activities that bring local actors, such as municipal governments and non-profits, together with the private sector to encourage activities that are both good for the economy and the environment. Successful Brightfields[CM] activities can help communities by improving electricity reliability, improving local air quality, and remediating or containing environmental damage on brownfield sites. These activities will only be successful, however, if the local demand for energy produces a market that is sufficient to entice the private sector to generate the supply to meet that demand.
- Brightfields[CM] are a clean option for serving local energy needs without adversely affecting air quality and climate.
- Brightfields[CM] also provide an opportunity to attract environmentally-conscious businesses that are interested in supporting green investments or locating to more environmentally-friendly industrial parks.
- Solar power provides environmental benefits that are especially attractive to urban areas with air quality concerns.

What are some other benefits of Brightfields[CM]?

Solar energy technologies offer a clean energy alternative, do not require a pristine location to be effective, and are adaptable to a variety of locations. The following points highlight some other benefits of converting brownfields into Brightfields[CM].

A Green Venture
Air Quality Benefits

Compatible with Diverse End Uses
Financial Benefits
Adaptable to All Sizes of Sites
Easy Installation, Minimal Maintenance, and Relatively Movable
An Attractive Interim Use Option
Reliable in Diverse Locations
Advanced Technology and Design
Employment Opportunities

A Green Venture

Brightfields[CM] offer a means of transforming a brownfield into a "green" venture. Solar energy systems provide a clean and reliable energy source that can be used to serve community businesses, residential homes, and local transit, among other energy users. Solar energy systems serve as one option in green power programs that let consumers choose among energy sources. This green alternative to brownfields can encourage community acceptance of redevelopment plans. Brightfields[CM] also provide an opportunity to attract environmentally-conscious businesses that are interested in supporting green investments or locating to more environmentally-friendly industrial parks. For companies already on the site, solar energy not only provides an alternative energy source for their operations but public relations benefits and an opportunity to market their business as a green venture. For companies that are responsible for the brownfield cleanup, Brightfields[CM] offers a redevelopment approach that can help them improve their public image by bringing clean technology to a former environmental eyesore.

Air Quality Benefits

Solar power provides environmental benefits that are especially attractive to urban areas with air quality concerns. With zero emissions, solar energy systems can offset emissions from other energy sources, particularly during peak hours when utilities often rely on older systems that pollute more heavily. Some cities with non-attainment concerns may view Brightfields[CM] not only as a reasonable and productive use of their brownfields, but also as a wise investment in meeting air quality goals and expanding energy demands. In fact, cities like Chicago have developed their own air credit programs which provide a financial incentive for using renewable energy like solar. And, the Environmental Protection Agency is developing a method for providing air credits for energy efficiency and renewable energy projects as part of implementation of the Clean Air Act. Finally, if a community is able to attract a solar technology manufacturer to locate on a brownfield, the local government, businesses, and residents have an easily accessible supply of solar systems to integrate into all types of uses and help address concerns about air quality and energy reliability.

Compatible with Diverse End Uses

Photovoltaic arrays can be installed on property without penetrating the surface of the property; therefore, photovoltaics offer a productive use, even for contaminated sites where soil must not be disturbed. Solar energy systems are consistent with industrial

land use, but also can be applied to commercial, residential, and open space properties. In some cases, communities may work with regulators to modify brownfields cleanup decisions if a permanent photovoltaic array is planned to serve as the long-term use.

Financial Benefits
While photovoltaics are often not the cheapest source of power, they can be the most cost-effective option to serve certain energy needs, including remote locations, off-grid needs such as emergency phones and security lighting in urban areas where power line extensions are costly, and peak demand. Although capital costs for investing in PV are high, the marginal costs of operating the systems are close to zero. The energy generated can either be used off-grid or sold back to the grid to produce some revenues. Even in cases where solar is more expensive than conventional power, some businesses and individual consumers are willing to pay more to get their energy from a clean source.

Locating solar energy systems on brownfields may allow cost savings through efficiencies in cleanup and maintenance. Solar energy systems do not require pristine conditions for operation and can be installed even on contaminated properties. Furthermore, institutional controls are often required on brownfields to ensure continued protection of human health, the environment, and the property. If a permanent installation of solar energy systems is planned, then the long-term use is more firmly guaranteed.

Adaptable to All Sizes of Sites
The size of the photovoltaic array as well as the method of installation can be tailored to meet the needs of the individual brownfields site. Solar arrays are made up of modular solar panels and can be sized according to energy needs and space availability. As a rough estimate, a solar array that covers three acres can generate approximately one megawatt of power-enough for about 300 homes-depending on the location of the site and other variables. Solar panels can be placed in trays on the ground, can be mounted into soil or concrete, or can be installed on buildings.

Easy Installation, Minimal Maintenance, and Relatively Movable
Solar panels are relatively easy to transport and install. Solar panels can be placed directly on flat-bed trucks and then transferred to a site either for placement on trays or more permanent mounting. Solar arrays and panels require minimal maintenance even in harsh climates.

An Attractive Interim Use Option
Given the relative ease of moving and installing solar panels, a community might consider placing a solar array on a brownfield site as an interim productive use prior to redevelopment. Once other redevelopment opportunities at the site are available, the solar panels can be integrated into the redevelopment plan or moved to another brownfield to generate power either on a permanent or interim basis. Using Brightfields^{CM} as an interim strategy allows productive use of multiple properties that would otherwise be unused, often for years or even decades prior to redevelopment.

Reliable in Diverse Locations
Solar energy is a reliable power source in most parts of the United States and many parts of the world. While certain locations, such as Arizona and New Mexico, have the most favorable conditions for solar energy, even cold climates and northern states have sufficient solar resources to make solar energy systems a viable choice. In fact, Chicago has about 75 percent of the solar resource of Arizona. Furthermore, solar energy systems with backup storage can provide an uninterruptable and reliable source of power. Its reliability makes solar a preferred energy source for serving certain critical functions such as medical equipment and continually operating computers.

Advanced Technology and Design
Photovoltaic technologies have improved tremendously over the past ten years and continue to advance in manufacturing and conversion efficiency. Several different technologies are currently available, including single-crystalline panels, poly-crystalline panels, thin-film, and solar shingles. Solar panels employ advanced technology and can be easily integrated into designs for new buildings, renovations of existing structures, and contemporary landscapes. As both an attractive and environmentally sound alternative, solar technologies have been incorporated into restored historical buildings, modern skyscrapers, and open space.

Employment Opportunities
The demand for solar technologies, particularly to serve the needs of developing countries, is growing rapidly and currently exceeds supply. The U.S. photovoltaic industry has grown at an average annual rate of 23 percent over the past seven years. And, the cost of photovoltaics is dropping with technological improvements and market changes.

The photovoltaic module manufacturing industry is projected to employ over 12,000 people directly and over 10,000 more indirectly by the year 2005. A photovoltaic module manufacturing facility that produces 10 MW of PV modules annually employs approximately 80 skilled technical workers, not including indirect jobs. Locating solar module manufacturers on brownfields, as one type of Brightfields^{CM} redevelopment approach, provides a great opportunity to create new jobs and spur local markets for solar energy systems.

Why is now the right time for Brightfields^{CM}?
Unprecedented changes in the way Americans purchase their electricity are currently underway. In light of energy sector restructuring, new environmental regulations, and solar technology advances, the opportunity for communities to create Brightfields^{CM} by redeveloping their brownfields with solar energy has never been more promising.

How can I get involved as a leader / member of a non-profit organization?
Successful Brightfields^{CM} projects require buy-in from a variety of stakeholders and depend upon collaboration among private businesses, utilities, community organizations, non-profits, and government agencies. Contact our network of Brightfields^{CM}

representatives either at the Department of Energy headquarters or at one of DOE's Regional Offices for more information on how you can get involved.

How can I get involved as an industry professional?

Contact our network of Brightfields[CM] representatives either at the Department of Energy headquarters or at one of DOE's Regional Offices. Once you get in touch with these key people, they can guide you through the process for involving your company in a Brightfield[CM] activity. Designing a successful venture requires your company to identify a lead partner in the public or non-profit sector at the local community level that will work with your company. This is a key aspect of beginning a Brightfield[CM] activity, as the local governing entities are the agency responsible for activities related to brownfields, landfill, and Superfund sites. It is critical that this local governing authority be included in the Brightfields[CM] process at an early stage.

How can I get involved as a local government official?

Contact our network of Brightfields[CM] representatives either at the Department of Energy headquarters or at one of DOE's Regional Offices. We have an excellent staff of professionals dedicated to working on Brightfields[CM] and other renewable energy activities. Our federal links and experience working with communities will help us to help you in identifying the steps necessary for moving forward in the development of a Brightfield[CM]. A key initial step for a local government is to identify brownfield site locations and energy/economic development needs at the local level. This is how the Brightfields[CM] identification and assessment process can begin. DOE can help guide local decision makers through this process.

How is energy sector restructuring important for Brightfields[CM]?

A summary of the factors motivating energy sector restructuring can be found at http://www.eia.doe.gov/cneaf/electricity/chg_str/booklet/drivers.html

The regulatory changes which motivated energy sector restructuring have fostered an environment of competition within the energy sector, thus opening up the potential for solar power generation to compete with other forms of energy for consumers. Many innovations in the energy sector have resulted from this new environment; one of the most promising for renewable energy has been the advent of Green Power. Energy generated from a Brightfield[CM] has the potential to supply Green Power-marketed electricity products to consumers — an activity that could not have happened without energy sector restructuring.

How are solar energy technologies used, and how can I learn more about them?

Solar energy technologies use sunlight to warm and light homes, heat water, and generate electricity.

A wealth of information on solar energy technologies can be found in the Solar section of

the Energy Efficiency and Renewable Energy Network's Web site.

Who can I contact for more information on activities in my area?

Contact the U.S. Department of Energy's Brightfields[CM] Coordinator at Headquarters in Washington, DC or contact the Brightfields[CM] point person at your regional DOE office.

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Tools for Brightfields[CM] Partners

We have developed a series of tools designed to aid you as you pursue your Brightfields[CM] activities:

Brightfields[CM] Project Template
Brightfields[CM] Technical and Economic Feasibility Assessment
Brightfields[CM] Presentation
Brightfields[CM] Brochure
Chicago Brightfields[CM]: A Success Story
Brightfields[CM] Listserv
Opportunities for Federal Support
Contacts
Links

Brightfields[CM] Project Template

Read and use this template to determine whether a Brightfields[CM] project is an option in your community. The document provides information on Brightfields[CM] benefits, questions to consider, and descriptions of input to use for an economic analysis spreadsheet.

Brightfield[CM] Photovoltaic Power Plant at Miramar Landfill: A Technical and Economic Feasibility Assessment

In partnership with the city of San Diego, the U.S. Department of Energy funded an analytic study to determine the feasibility of developing a Brightfield[CM] (200 kW, 500 kW, 1 MW) on a landfill site. This study should be used by those interested in understanding how to implement a Brightfields[CM] activity.

Brightfields[CM] Presentation (PPT 1,419 KB)

This Power Point presentation, given by Dan Reicher, the former DOE Assistant Secretary of Energy Efficiency and Renewable Energy, highlights the vision, goals, and applications of Brightfields activities; it also describes the success of Brightfields[CM] in Chicago. This presentation can be downloaded and used by energy professionals, government officials, and other Brightfields[CM] partners to effectively communicate about Brightfields[CM] to members of their communities.

Brightfields[CM] Brochure (PDF 275 KB)

This brochure describes the vision, goals, and applications of Brightfields[CM] activities, and includes specifics on the Chicago Brightfields[CM] project. This document can be downloaded and used to explain about Brightfields[CM] to anyone interested in learning more about this innovative approach to brownfields redevelopment.

Chicago Brightfields[CM]: A Success Story (PDF 1,059 KB)

This fact sheet describes the success of Brightfields[CM] activities in Chicago, and includes specifics on the evolution of the project and the Department of Energy's role in the project. This document can be downloaded and used as an example of how Brightfields[CM] projects can be implemented in a community.

Brightfields[CM] Listserv

The Brightfields[CM] Listserv is a tool designed to foster communication among energy professionals, government officials, and other stakeholders interested in either undertaking or learning more about Brightfields[CM] activities.

Opportunities for Federal Support

DOE can provide support for Brightfields[CM] projects in a number of ways; this page details those opportunities.

Contacts

This page lists contact information for Brightfields[CM] coordinators at DOE national and regional offices.

Links

This list of links will direct you to other sites with useful information on economic development, environmental remediation, solar energy, energy sector restructuring, and public benefits from Brightfields[CM] activities.

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What is Brightfields? | Tools for Brightfields Partners | Brightfields Activities

Brightfields℠ Activities, by Region

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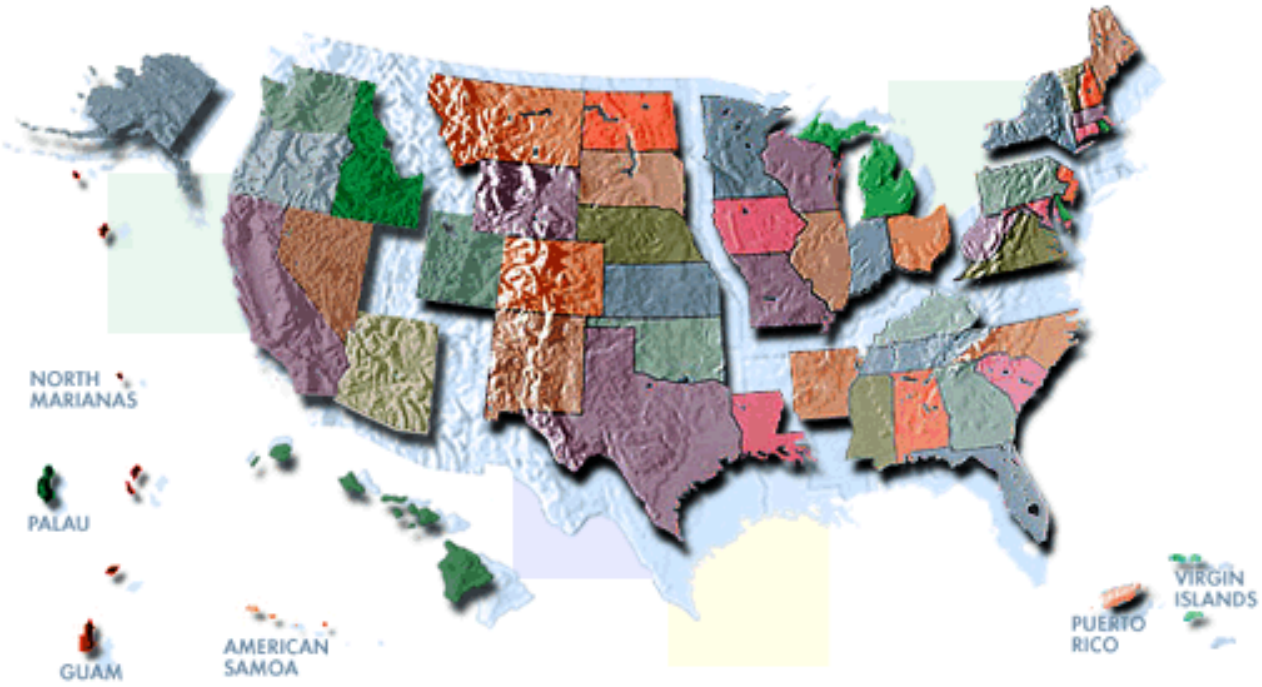

U.S. Department of Energy Regional Offices

Click on the region to find out about Brightfields activities in your area.

- Areas served by the Atlanta Regional Office
- Areas served by the Boston Regional Office
- Areas served by the Chicago Regional Office
- Areas served by the Denver Regional Office
- Areas served by the Philadelphia Regional Office
- Areas served by the Seattle Regional Office

Brightfields[CM] Project Template

Through the efforts of the U.S. Department of Energy, the National Renewable Energy Laboratory, and Millennium Energy, this Brightfield project template has been designed to assist cities and other entities to help them determine whether to implement a Brightfield[CM] project in their community.

The template has four sections:

1. **Brightfields[CM] Information**: describes the Brightfields[CM] concept and the economic, environmental, and community benefits. For more information on the Brightfields[CM] Initiative, see our What is Brightfields? section.
2. **Brightfields[CM] Analysis Questions**: describes economic, financial, and technical questions a city should ask when considering a Brightfield[CM] project.
3. **Brightfields[CM] Calculator Definitions**: defines the financial analysis spreadsheet inputs and outputs.
4. **Brightfields[CM] Calculator (Excel 45 KB)**: financial analysis spreadsheet that allows user to input economic values and calculate economic results. Note: you can keep a copy of the spreadsheet you create by saving the spreadsheet to your computer.

Directions for the financial analysis process:

Step 1. If the type and size of solar electric system has been identified and the average annual kWh output of the system is known, proceed to Step 4.

Step 2. If the type and size of solar electric system is known, but the average annual kWh output is not, proceed to the National Renewable Energy Laboratory's PVWATTS program. This program will calculate the annual system output number needed for the Brightfields^{CM} Calculator (Excel 45 KB).

Step 3. If help is needed in determining what type and size of solar electric system to consider, review the Brightfields^{CM} Analysis Questions section. Once this is determined, proceed to the National Renewable Energy Laboratory's PVWATTS program. This program will calculate the annual system output number needed for the Brightfields^{CM} Calculator (Excel 45 KB).

Step 4. If the solar electric system type and size has been determined and the average annual output of the system is known, proceed to the Brightfields^{CM} Calculator (Excel 45 KB) to perform a financial analysis. The Brightfields^{CM} Calculator Definitions section describes the input and output numbers.

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Brightfield[CM] Photovoltaic Power Plant at Miramar Landfill: A Technical and Economic Feasibility Assessment

In partnership with the city of San Diego's Department of Environmental Services, the U. S. Department of Energy undertook a detailed technology and economic feasibility study to determine the viability of developing up to a one megawatt (MW) Brightfield[CM] at the city of San Diego Landfill site located adjacent to the Marine Corps Air Station-Miramar.

The placement of solar arrays on landfills within San Diego city limits can convert these sites from non-revenue generating city property into a revenue- and electricity-generating asset for the city of San Diego. In addition, with expected continued shortfalls in electricity generation supplies likely, a Brightfield[CM] could be a cost-effective means of enhancing electricity reliability and reducing electricity price volatility while meeting Clean Air requirements. This study determined that a Brightfield[CM] can be an economically viable option for power production.

NOTE: *Electricity prices and incentives have changed since this study was undertaken. The study analyzed one specific site in San Diego, California. Cost assumptions included a California Energy Commission buy-down of $1.5 per watt, which has now changed to $4.5/watt, thus greatly reducing project costs. Incentives exist in other states, and federal government incentives may be available in the future. Please take into account on-going price and cost-incentive changes when reviewing the feasibility study.*

View the study (PDF 2,749 KB).

Chicago: the first Brightfields success story.

The City of Chicago recently became the first community to undertake a Brightfields project (August 1999). The Mayor's Office worked jointly with the DOE and the electric utility Commonwealth Edison (ComEd) to develop an extensive Brightfields plan. The plan was designed to advance the City's economic development, climate change, air quality, and electric reliability goals through the incorporation of solar technology. This Chicago Brightfields project is the result of many businesses, community organizations, and government agencies working together towards the revitalization of an underutilized urban site. As a result:

- Spire Solar Chicago (a manufacturer of solar equipment) is constructing a new solar manufacturing facility that will produce 3 megawatts of solar panels per year, thus creating 100 new jobs and spurring local economic development.
- The plant will be constructed and located on a former brownfield site on Chicago's West Side, thereby revitalizing a brownfield site.
- The City of Chicago and ComEd are committed to purchasing $8 million of these solar panels. The panels will be placed on brownfield sites, as well as other locations, in order to provide clean energy to schools, office buildings, transportation routes, and municipal and commercial properties in Chicago. Such activity will enhance electric system reliability, provide public health benefits, and create new markets for solar energy.

How do I find out more about Brightfields?

Please contact the U.S. Department of Energy's Brightfields Coordinator at:
Phone: (202) 586-6713
Fax: (202) 586-8177
Email: brightfields@ee.doe.gov

Visit the Brightfields website at
http://www.eren.doe.gov/brightfields

Office of Energy Efficiency and Renewable Energy

Brightfields

Redeveloping Brownfields with Solar Energy

Clean ENERGY – for the – 21st Century

U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy

What are Brightfields?

Brightfields encourage economic development on brownfield[1] sites through solar energy applications. The Department of Energy (DOE) is working with communities across the country to help them apply this innovative approach to community revitalization. The Brightfields concept encompasses a broad array of projects that incorporate solar energy and brownfields, such as:

- A solar energy manufacturing plant located on the brownfield site;
- building-integrated solar energy systems located on the brownfield site; and,
- solar electric systems placed directly on top of the brownfield site.

Brightfields…

- foster economic activity;
- improve local air quality and electric system reliability; and,
- create solar energy markets.

Brightfields turn environmental losses into economic gains.

Brightfields activities operate on lands that have been developed in the past but are currently underutilized and seen as burdens on local economic resources. Brightfields can help communities to maximize the value of their brownfields sites by converting their economic burdens into revenue generating assets. In some circumstances, Brightfields can actually cut the cost of brownfield remediation.

[1] A brownfield is an abandoned, idled, or under-used industrial and commercial site where expansion or redevelopment is complicated by real or perceived environmental contamination; it also has an active potential for redevelopment or reuse.

A window of opportunity for Brightfields.

Unprecedented changes in the way Americans purchase their electricity are currently underway. As new electric utility restructuring, environmental regulations, and solar technology advances are all taking place, the opportunity for communities to create Brightfields by redeveloping their brownfields with solar energy has never been more promising. The Department of Energy's Office of Energy Efficiency and Renewable Energy encourages communities to take advantage of this historical moment.

How can the Department of Energy help your community create a Brightfield?

The DOE Office of Energy Efficiency and Renewable Energy (EERE), a prime researcher and developer of advanced clean energy technologies for the U.S. taxpayer, has world class experts available to support Brightfields activities. Training and technical assistance in land use planning, financing, and other issues can be provided to local decision-makers through both these experts and EERE's six regional offices.

How to make Brightfields projects work in your community.

Successful Brightfields projects require buy-in from a variety of stakeholders and depend upon collaboration among private businesses, energy companies, community organizations, and government agencies. Brightfields projects can take advantage of local economic incentives for solar energy, brownfields re-development, and other federal programs such as "empowerment zones / enterprise communities" in order to help develop commercially viable projects.

New Home of Spire Solar Chicago

Artist's rendering of the Midwest Center for Green Technology. ©2000 Farr Associates Architecture and Urban Design, Chicago.

Embedded Secure Document

The file *http://www.eere.energy.gov/brightfields/pdfs/chicago_brightfields_success.pdf* is a secure document that has been embedded in this document. Double click the pushpin to view.

The Brightfields[CM] Listserv is a tool designed for stakeholders that are interested in either undertaking or learning more about Brightfields[CM] activities. The Listserv is intended to help stakeholders implement successful Brightfields[CM] activities by connecting them with potential Brightfields[CM] partners, locating potential Brightfields[CM] site locations, discussing financial resources, sharing experiences and lessons learned, and communicating any other information relevant to Brightfields[CM] activities.

If you have questions about Brightfields[CM] or about using the Listserv, send them to the national Brightfields[CM] Coordinator at brightfields@ee.doe.gov.

Subscribe to the Brightfields[CM] Listserv
Unsubscribe to the Brightfields[CM] Listserv
Change Your Address

Subscribe to the Brightfields[CM] Listserv

To join the Brightfields[CM] Listserv, simply fill out the form below. The information you provide will not be sold, rented, distributed, or disclosed in any way.

* Indicates a required field.

Last Name*:

First Name*:

Complete e-mail address*:

Name of your affiliation/organization*:

Which of these groups best describes your affiliation/organization?
(choose 1 or more)

- ☐ Commercial—Large Business
- ☐ Commercial—Small Business
- ☐ Federal Government
- ☐ Consultant
- ☐ Student
- ☐ Educator
- ☐ Consumer/Private Citizen
- ☐ Utility
- ☐ Other

Describe your interest in Brightfields[CM].

Submit Clear

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Opportunities for Federal Support

Department of Energy: DOE can help you analyze the economic and technical feasibility of potential Brightfields[CM] activities. For information contact DOE Headquarters or your regional office.

Environmental Protection Agency: EPA is currently accepting funding proposals for new National Brownfields Assessment Pilot projects and for supplemental assistance for existing projects (see the Brownfields Application Information Web site). The Brownfields assessment pilots, each funded up to $200,000 over two years, test assessment models and facilitate coordinated assessment and cleanup efforts at the federal, state and local levels. An additional $50,000 may be awarded to an applicant to assess the contamination of a brownfields site(s) that is or will be used for Greenspace purposes.

- Deadline for submitting new proposals: December 10
- Deadline for submitting proposals for 2002 supplemental assistance: November 26

For more information contact Shane Reed (202-260-7323) or visit the Brownfields Application Information Web site.

DOE National Contact

Mark Ginsberg Brightfields[CM] National Coordinator	DOE Headquarters Office of Energy Efficiency and Renewable Energy 1000 Independence Ave., SW Washington, DC 20585-0121	202-586-6713

DOE Regional Office Contacts

Steve Hortin	Atlanta Regional Office 75 Spring St., Suite 200 Atlanta, Georgia 30303–3308	404-562-0593
Richard Michaud	Boston Regional Office JFK Federal Building, Suite 675 Boston, MA 02203	617-565-9713
Juli Pollitt	Chicago Regional Office One South Wacker Dr., Suite 2380 Chicago, IL 60606	312-886-8571
Pat Lana	Denver Regional Office 1617 Cole Blvd. Golden, CO 80401	303-275-4818
Stephen Miller	Philadelphia Regional Office The Wanamaker Building 100 Penn Square East, Suite 890 Philadelphia, PA 19107-3396	215-656-6961
Heather Mulligan	Seattle Regional Office 800 Fifth Avenue, Suite 3950 Seattle, WA 98104	206-553-7693

Links

Economic Development GO

Economic Development

These sites provide information on federal and local government economic development programs and initiatives concerned with the financing of activities in economically distressed urban and rural areas. These programs and initiatives can finance Brightfields[CM] activities.

Empowerment Zone/Enterprise Communities
State Resources

Environmental Remediation

These links provide information on how to evaluate and seek support for environmental clean-up activities on contaminated (or perceived to be contaminated) sites; these are the sights upon which Brightfields[CM] should be located.

EPA's Brownfields Program
EPA's Superfund site
EPA's Municipal Solid Waste Disposal site
EPA's Air Pollution Monitoring site (information on clean air credits)

Solar Energy

These sites provide information on all aspects of solar energy; solar energy is the foundation of a Brightfields[CM] activity.

EREN's Solar links page (information on solar technologies)
EREN's Financing Solutions
Solar Energy Industries Association

Energy Sector Restructuring

These sites contain current changes in energy sector policies at the state and local levels, as well as information on how these regulatory and structural changes are affecting private renewable energy markets. These policies will directly affect potential Brightfields[CM] activities in both project finance and market development.

Clean Energy Funds
Green Power Network

Public Benefits from Brightfields[CM] Activities
These links provide information on potential benefits to the general public that can arise from successfully implementing Brightfields[CM] activities.

Health Effects Notebook for Hazardous Air Pollutants (information on the effect of hazardous materials on human health)

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Brightfields[CM] Activities, by Region

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Brightfields[CM] activities in the region served by the Atlanta Regional Office

Alabama	Kentucky	Tennessee
Arkansas	Mississippi	Puerto Rico
Florida	North Carolina	Virgin Islands
Georgia	South Carolina	

For more information on Brightfields[CM] activities in the states above, contact:

Steve Hortin (steve.hortin@ee.doe.gov)
Atlanta Regional Office
75 Spring St., Suite 200
Atlanta, Georgia 30303 - 3308
404-562-0593

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Brightfields[CM] activities in the region served by the Seattle Regional Office

Alaska	Idaho	American Samoa
Arizona	Nevada	Guam
California	Oregon	North Marianas
Hawaii	Washington	Palau

For more information on Brightfields[CM] activities in the states above, contact:

Heather Mulligan (heather.mulligan@ee.doe.gov)
Seattle Regional Office
800 Fifth Avenue, Suite 3950
Seattle, WA 98104
206-553-7693

Brightfields[CM] activities in California:

San Diego

The Department of Energy recently entered into a Brightfields partnership with the city of San Diego with the goal of placing solar arrays onto landfill sites for power generation. DOE provided technical assistance to the city's Environmental Services Department during the feasibility study phase and is now helping to forge a partnership between the city and DOD/Miramar Air Base, the owner of the proposed site.

Richard Hays (left), the director of the city of San Diego's Environmental Service Department, holds a copy of the city's Resolution proclaiming November 30, 2000 Renewable Energy Day. The Resolution was signed by the City Council. Also featured (right) is Bob Eppler, also of the Environmental Service Department.

San Diego News Update (January, 2001):

On January 8, 2001 Mayor Dick Murphy gave a State of the City address in which he identified energy independence as a city goal, and spoke about the role of renewable energy and the San Diego Brightfields[CM] project in achieving this goal.
Read excerpts of Mayor Murphy's address.

Former Mayor Susan Golding proclaimed November 30, 2000 to be Renewable Energy Day in recognition of the Department of Energy's assistance.
Read Mayor Golding's proclamation.

Celebrating Renewable Energy Day, Brightfields[CM], and the Livable Communities partnership between the Department of Energy, the city of San Diego, and other federal partners. *Featured left to right: Linda Pratt (City of San Diego, Environmental Service Dept.), Bob Eppler (City of San Diego, Environmental Service Dept.), Alan Hurt (US Dept. of Defense, Navy), Paul Johnson (US Department of Energy, Seattle Regional Office), Joel Rubin (former Brightfields Coordinator, US Department of Energy, Washington, DC), Richard Hays (Director, city of San Diego, Environmental Service Dept.), Alex Sachs (US Dept. of Housing and Urban Development), Heather Mulligan (US Department of Energy, Seattle Regional Office), Scott Anders (San Diego Regional Energy Office), Carolyn Chase (San Diego Sierra Club).*

Brightfields[CM] activities in Washington:

Hanford

Brightfields[CM] grants have recently been awarded to three U.S. communities. The funding for these grants was provided by the DOE Office of Power Technologies / Office of Solar Energy through the Fiscal Year 2001 State Energy Programs Special Projects solicitation. These grants will go towards the implementation of Brightfields[CM] activities in Hanford, Washington; Brockton, Massachusetts; and Atlantic City, New Jersey.

Hanford was awarded $50,000 for its 40 kW pilot project. This project will set a national example for re-use of Superfund sites by locating a solar energy power plant on the ground in Brightfields[CM] array form. Partner organizations include Energy Northwest, Bonneville Environmental Foundation, Bonneville Power Administration, and Washington State University.

For more information on the Hanford project, contact DOE Seattle Regional Office representative Heather Mulligan.

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Brightfields[CM] activities in the region served by the Denver Regional Office

Colorado	Nebraska	South Dakota
Kansas	New Mexico	Texas
Louisiana	North Dakota	Utah
Montana	Oklahoma	Wyoming

For more information on Brightfields[CM] activities in the states above, contact:

Pat Lana (pat.lana@ee.doe.gov)
Denver Regional Office
1617 Cole Blvd.
Golden, CO 80401
303-275-4818

Brightfields[CM] activities in the region served by the Philadelphia Regional Office

District of Columbia Maryland New Jersey West Virginia
Delaware Pennsylvania Virginia

For more information on Brightfields[CM] activities in the states above, contact:

Stephen Miller (stephen.miller@ee.doe.gov)

The Wanamaker Building
100 Penn Square East, Suite 890
Philadelphia, PA 19107-3396
215-656-6961

Brightfields[CM] activities in New Jersey:

Atlantic City

Brightfields[CM] grants have recently been awarded to three U.S. communities. The funding for these grants was provided by the DOE Office of Power Technologies / Office of Solar Energy through the Fiscal Year 2001 State Energy Programs Special Projects solicitation. These grants will go towards the implementation of Brightfields[CM] activities in Hanford, Washington; Brockton, Massachusetts; and Atlantic City, New Jersey.

Atlantic City will spend the awarded $50,000 to demonstrate a high leverage opportunity for solar energy by completing a buildings-integrated photovoltaics activity at the "Cityscape Solar-Powered Bed and Breakfast". The Bed and Breakfast will be located on a former brownfield site. The city of Atlantic City, Casino Reinvestment Development Authority is the local partner organization.

For more information on the Brockton project, contact DOE Philadelphia Regional Office representative Stephen Miller.

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Brightfields[CM] activities in the region served by the Boston Regional Office

Connecticut	Massachusetts	New York	Vermont
Maine	New Hampshire	Rhode Island	

For more information on Brightfields[CM] activities in the states above, contact:

Richard Michaud (Richard.Michaud@ee.doe.gov)
Boston Regional Office
JFK Federal Building, Room 675
Boston, MA 02203
617-565-9713

Brightfields[CM] activities in Massachusetts:

Brockton

Brightfields[CM] grants have recently been awarded to three U.S. communities. The funding for these grants was provided by the DOE Office of Power Technologies / Office of Solar Energy through the Fiscal Year 2001 State Energy Programs Special Projects solicitation. These grants will go towards the implementation of Brightfields[CM] activities in Hanford, Washington; Brockton, Massachusetts; and Atlantic City, New Jersey.

Brockton will spend the awarded $30,000 promoting brownfields clean-up, economic development, and renewable energy markets by attracting a solar manufacturer to a brownfield site. The city of Brockton, Office of the City Planner is the local partner organization.

For more information on the Brockton project, contact DOE Boston Regional Office representative Richard Michaud.

To learn more about Brightfields[CM] in Brockton, check out this publication:

- Press Release (11/19/01) — City of Brockton, MA Receives US Department of Energy

Brightfields Grant (PDF 13 KB)

- Press Release (7/26/01) — Spire Corporation to Help Brockton, MA, Develop Solar Energy Generating Facility

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Brightfields[CM] activities in the region served by the Chicago Regional Office

Illinois	Iowa	Minnesota	Ohio
Indiana	Michigan	Missouri	Wisconsin

For more information on Brightfields[CM] activities in the states above, contact:

Juli Pollitt (juli.pollitt@ee.doe.gov)
Chicago Regional Office
Chicago, IL 60606
312-886-8571

Brightfields[CM] activities in Illinois:

Chicago

In August of 1999, the city of Chicago entered into a partnership with the Department of Energy to become the first city to undertake a Brightfields[CM] project. Working with the electric utility Commonwealth Edison and Spire Corporation (a solar equipment manufacturer), this partnership has succeeded in developing a new, 15 million dollar market for photovoltaic (PV) technologies in Chicago.

Spire Corporation will meet this new PV demand by producing PV panels at its newly constructed PV factory, which is located in the Midwest Center for Green Technology, on a former Chicago brownfield site. The factory will create 100 new jobs. View an artist's rendering of Spire Solar Chicago's new home.

PV output from the Spire Corporation factory will be placed on brownfields sites, school rooftops, office buildings, transportation routes, and municipal and commercial properties throughout Chicago.

To learn more about Brightfields[CM] in Chicago, check out these publications:

- Fact Sheet — Chicago Brightfields[CM]: A Success Story (PDF 1,059K)
- Press Release (8/4/99) — Chicago Developing New Center for "Green" Industry: Solar Plant Will Turn West Side Brownfield into "Brightfield[CM]"

Chicago News Update (October, 2000):

The city has announced that ten 50 kW PV systems will be installed on major city museums by the end of 2001. A 30 kW installation on the roof of the Peggy Notebaert Nature Museum was recently completed by Spire Corporation. View Spire's announcement of the new installation.

Electricians from the Local 134 International Brotherhood of Electrical Workers donate their time installing panels at Reilly Elementary School (background) while students conduct solar energy experiments (foreground).

So far, one school (Reilly Elementary) has been outfitted with a 10 kW PV system. Reilly will soon be joined by five other schools. The city hopes to continue this program in the following years; as many as 50 schools may eventually be equipped with solar technologies.

In addition to adding PV to buildings, the city is installing the nation's largest solar array (2.5 mW) on an abandoned landfill as part of the Lake Calumet area sustainable development strategy. This landfill will also be home to a 4.5 mW landfill gas generation station.

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Brightfields[CM] Project Template: Information

Definition:
A brownfield is an abandoned or polluted industrial or commercial site where redevelopment is complicated by real or perceived environmental contamination. Brownfield sites include landfills and Superfund sites. Many brownfields have a great potential for reuse or redevelopment.

Brightfields[CM], a term coined by the U.S. Department of Energy, are brownfield sites that are redeveloped through the incorporation of renewable energy or distributed energy generation applications, including solar electric systems for which this template was designed. Solar electric systems are also called photovoltaic (PV) systems. A Brightfield[CM] can include a variety of projects such as building a solar electric module manufacturing plant on the brownfield, or placing solar electric systems directly on the brownfield ground or on existing buildings.

Brightfield[CM] projects promote sustainable communities by:

1. Facilitating brownfield remediation and redevelopment
2. Increasing electrical supply reliability
3. Promoting clean, energy-related economic development
4. Promoting renewable energy technology use and reaping the resulting environmental benefits
5. Creating jobs that promote renewable energy.

1. Brownfield remediation and redevelopment

- Solar electric systems may be placed on brownfields even if the land is contaminated, thereby, transforming a once unusable piece of property into a possible revenue-generating piece of land.
- In many cases, the cost of cleaning up a contaminated location exceeds the future revenues that the site may derive. By placing a solar electric system on such sites, an entity can generate revenue while minimizing clean-up costs.

2. Improving electricity reliability

- Since solar electricity is a distributed generation application, if utility power is interrupted, the facility will still have electricity if the system is directly tied to the facility.
- Distributed generation technologies help to strengthen the utility grid and reduce electrical losses by siting the generation source at or near the facility, thereby shortening the distance the electricity has to travel.
- Photovoltaic modules have become more efficient and less expensive in recent years, and many manufacturers provide up to a 30-year warranty.
- Over five different PV panel technologies are now commercially available to suit various applications and budgets.
- PV system inverters, once thought of as the weak-link of solar electric systems due to triggering down times, have made great technological progress and are highly reliable.

3. Economic development

- Photovoltaic systems can be cost-effective in certain markets, including remote locations; off-grid locations such as emergency phones and security lighting in urban areas, and in areas where power line extensions are costly; and urban areas with high energy and demand costs.
- PV systems have low annual operation and maintenance costs. After the initial purchase and installation of the system, the marginal costs of operating a system can be close to zero.
- In many regions, energy not used by the PV systems can be sold back the regional utility if net metering programs have been established.
- Market research has indicated that many individuals and companies will pay extra for a clean energy source.

4. Environmental benefits through advanced technology

- PV systems have zero emissions. Electricity produced by these systems can offset the harmful emissions produced by conventional electricity generation.
- If a city or community is able to attract a solar technology manufacturer to locate on a brownfield, the local government, businesses, and residents have an easily accessible supply of solar systems to integrate into all types of uses and help address air quality and reliability concerns.

5. Job creation

- The solar electric industry is a rapidly growing industry. Current demand for PV modules surpasses supply.
- By 2005, it is estimated that PV module manufacturers will employee over 25,000 people, directly and indirectly.

- PV manufacturing facilities that are located on brownfields will create new jobs and boost the local economy and local demand for PV systems.

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Brightfields[CM] Project Template: Analysis Questions

When contemplating the implementation of a Brightfield[CM] project in a city, several considerations must be taken into account. Since the Brightfield[CM] development process will be different for each city, this document serves as a checklist of points to be used when deciding on whether or not a Brightfields[CM] Initiative is compatible for a city.

- **Are there any federal, state, regional or local incentives?**
  These incentives will include economic incentives such as direct system hardware buy-down funds, clean air credits, production credits, "green tag" credits, tax incentives, and economic development incentives. To check state incentives, please visit the Database of State Incentives for Renewable Energy.

- **Are there any specific state or local requirements?**
  These requirements may include a negative declaration of environmental impact, policy considerations, land use permitting within the city, citing considerations, and other permits.

- **What does the local utility require?**
  Depending on whether or not the local utility is a non-municipal or a municipal utility, the requirements will vary. Typical requirements include those regarding interconnection of the photovoltaic system to the utility grid, standby charges, specific distributed generation rate tariffs, and permitting.

- **Should the PV system provide power to the on-site facility, off-site facility, or be sold back into the electric grid?**
  A city should look into the costs associated with both options including any utility transaction fees, net metering options, and current and projected electricity costs.

- **How should the Brightfield[CM] project be financed?**
  In addition to traditional financing options, a city should look into additional

options including special project city funds that may have a lower interest rate, joint powers of agreements where a number of entities help to finance the system and all receive benefits of the Brightfield[CM] project, or issuing a public bond initiative such as the City of San Francisco has done for a similar effort.

- **Who should comprise the project development team?**
  It is important that the team contain a variety of expertise including technical, policy, and financing in order to be able to research and address all requirements and incentives.

- **What size PV system?**
  The size of a PV system that an entity may opt for will largely depend on budget. However, with that aside, a brighfield project typically is sized to meet the annual energy requirements (kWh) of the facility. Some entities have opted to build above that threshold with plans to either sell the electricity back to the local utility (if the utility has a net-metering program that allows for excess generation), sell directly to third parties, or distribute the excess electricity to an off-site facility.

- **What type of PV system?**
  There are several PV technologies that are available in the market today. However, some state or federal incentives may preclude you from using some of the newer technologies until they are commercially proven. Therefore, this template incorporates the use of the two most common PV module types:
    - Crystalline silicon modules; and
    - Amorphous silicon ("thin film") modules.

  It should be noted that trade-offs do exist between the use of thin film and crystalline silicon modules, including:

    - Thin film modules cost considerably less (~$3.00/watt) than crystalline silicon modules (~$4.00/watt).
    - Older thin film modules typically carry a warranty of 10-15 years, but newer generation technologies are now carrying 20-25 year warranties. Crystalline silicon modules typically carry a warranty of 20-25 years. Make sure to check with the manufacturer to verify the warranty period.
    - Thin film modules require two times the array surface area for the same level of power output of crystalline silicon modules, and as such, require additional hardware, mounting equipment, and installation labor, which adds to the cost of the system.
    - Thin film modules do not lend themselves to be used in conjunction with a tracking system, as they are more fragile, and require additional mounting hardware.

  Additionally, large PV arrays, typically what you would find in a Brightfield[CM] application, can be either fixed mounted (stationary arrays) or track mounted.

There also trade-offs that exist between the use of fixed mount and tracking mount structures. Tracking mount structures, which tilt the modules at a constant angle to maximize the efficiency of the modules, can increase system output of the same module types by up to 18%. The trade-off is that tracking mounts are more expensive, but recent advances in the technology have reduced this incremental cost to about 2% above a fixed mount structure.

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Brightfields[CM] Project Template: Brightfields[CM] Calculator Definitions

Input Values

Life of PV System - This is the estimated number of years that the PV system will be in operation. Input a range of 1 to 30 years.

PV System Generation - The total kWhr/year that the PV system generates based on the type of PV modules, size of the array, and location of system. This information can be derived using NREL's PVWATTS performance calculator.

Year '1' Cost of Energy - The present electricity rate for the designated location in $/kWhr. If demand (kW) charges are included in the existing rate tariff to the facility, then a "blended energy rate" should be developed to incorporate the demand charges.

Cost of Energy Escalator - The estimated percentage rise in cost of electricity due to factors such as inflation and projected price increases. The typical range is between 0.5-4.0. Input as a number, not as a percentage.

Annual Tax Credits - The average amount of tax credits, (i.e. clean air credits, federal or state tax incentives, green tag credits) that the system is eligible for. The input should be in an annual whole dollar amount. DO NOT include the Federal Renewable Energy Production Incentive; this credit is already factored into the formulas. If no tax credits will be received, input '0.'

Total Years for Tax Credits - The total number of years that the system is eligible to receive tax credits. This number cannot exceed the expected life of the PV system. DO NOT include the Federal Renewable Energy Production Incentive; this credit is already factored into the formulas (see note below). If no tax credits will be received, input '0.'

Cost of PV System - The upfront cost of the entire PV system including modules, inverter(s), balance of system components, and installation. Do NOT include any rebates or financing options into this amount. Additionally, this amount does not include the purchase price of the land or any foregone clean-up costs.

Downpayment for the PV System - The expected amount of money that will be paid upfront for the PV system. If no down payment is planned, then input '0.'

Total Rebates for the PV System - The total whole dollar amount of any direct rebates, state and/or federal, that the PV system will receive ***immediately upon installation***. If no rebates will be received, then input '0.'

Years Needed to Finance System - The number of years that the PV system will be financed. The numbers of years CANNOT exceed the expected life of the PV system.

Interest Rate to Finance System - The interest rate associated with the financing terms for a loan for the PV system.

Discount Rate - The rate at which future sums are discounted back to the present. If this rate is unknown, a sensible rate to input would be the 3.0-10.0% range.

Output Values

Amount of Financing Needed - The amount of dollars needed to finance the PV system after the down payments and any rebates are factored in. Amount of financing needed = total cost of PV system - direct rebates - down payment.

Annual Payment for the PV System - The annual payment needed to be made on the PV system based on term of the loan, present value loan amount, down payment for the system, and interest rate.

Net Present Value of the PV System - The present value of all of the benefits (kWhr generated, tax credits) minus the present value of all of the costs (annual payments, O&M costs) associated with the life of the PV system. A positive value reflects that a project should be accepted or considered.

Benefit-Cost Ratio - The ratio of the benefits (kWhr generated, tax credits) to the present value of all of the costs (annual payments, O&M costs) associated with the life of the PV system. A number greater than one indicates that a project should be accepted or considered.

Cost of System Generation - The total present value of all costs associated over the life of the PV system compared to the total generation for the life of the PV system. Expressed in $/kWhr.

Average Annual Value of Energy - The annual value of energy takes into the account the annual PV system generation in kWh and determines the value of that electricity based on the current and future costs of electricity that a facility or site is currently paying. The total value of energy incorporates the annual value of energy

produces by the PV system and adds any tax and production credits that the system will receive each year.

Simple Payback Period - The payback period indicates the time period required to recoup an initial investment and does not include the discount rate. The total value of energy was averaged to derive the average annual value of energy. The initial cost of the PV system minus any upfront rebates that a system is qualified for was then divided by this average annual value of energy.

*****Note*****
At the federal level, the US DOE offers economic incentives via its Renewable Energy Production Incentive (REPI) Program. The program currently offers a production credit to state and local government agencies and non-profit electric cooperatives of 1.8 cents per kWh. The program is structured in tiers, and Tier 1 incentives are available for photovoltaic, wind, and closed loop biomass systems. These funds are subject to annual budget appropriations, and the program is currently authorized through the year 2013. The payments are authorized annually based on the prior year's energy production levels, and the incentive levels escalate annually based on a formula tied to annual inflation rates. A system is eligible to receive these funds in December 2001 for the prior year's energy production (through September 30, 2001), and then annually for each year that funds are appropriated. This template incorporates these credits so that the REPI credits are valued at 1.8 cents/kWh during the base year. An escalation factor of ~3% was added to each subsequent year of plant operations over the expected thirteen year life of the REPI program. The 3% escalation factor was calculated based on historic escalation factors applied to the program in previous years.

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Excerpts from San Diego Mayor Dick Murphy's State of the City Address *(January 8, 2001)*

Read the full text of Mayor Murphy's address.

The Mayor's address outlined 10 goals he hopes to accomplish during the next four years. Below are excerpts from the Mayor's speech in which he discusses the role of renewable energy and the San Diego Brightfields[CM] project in helping San Diego achieve energy independence:

"I also told you during my inaugural speech that I would outline my vision for San Diego during my State of the City Address. So what is that vision?

In his book, 'Cities on the Rebound', former Indianapolis mayor William Hudnut dedicates a chapter to the idea that the aim of a city should be to create places worthy of our affection. Of course, San Diegans love San Diego. But while there is much to celebrate in our city, there are also serious problems. We must embark on a bold agenda to deal with these problems if we want San Diego to still be worthy of our affection in the year 2020. To make San Diego a city worthy of our affection in the year 2020, I propose to accomplish ten goals during the next four years."

"Goal 9: Pursue Energy Independence

The State's energy deregulation policies have created an energy crisis that threatens our economy and our personal financial security. And the Federal Energy Regulatory Commission has been unwilling to protect Californians from greedy power generators. While we can hope that our representatives in Washington and Sacramento will solve this crisis, San Diego needs to carve out its own path to energy independence.

We have already started down that path. Next week I have a meeting scheduled with the U.S. Department of Energy to review a feasibility study for installing photovoltaic arrays to collect solar energy at our city landfills. This is part of the Brightfields[CM] Initiative, an opportunity for clean power generation that does not degrade our air quality. In addition, the city will begin construction during the year 2001 of a hydroelectric generating facility at the Point Loma Wastewater Treatment Plant. This is a good start.

But we need to do more. I will be asking the city manager to create the position of city energy czar — perhaps working out of the city's Environmental Services Department. I would envision this person working with the Regional Energy Office to pursue the following initiatives:

- A comprehensive energy conservation program for all city facilities
- Incentives to encourage energy conservation in new private development
- A public education program to encourage citizen energy conservation
- A study of the feasibility of a municipal utility district.

Our goal should be to make San Diego a model city in energy conservation and the utilization of renewable energy resources."

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Former San Diego Mayor Susan Golding's Proclamation of Renewable Energy Day

WHEREAS, the city of San Diego faces unprecedented energy reliability concerns with substantial economic impact to commercial businesses, residents, and government agencies; and

WHEREAS, the city of San Diego is dedicated to working for solutions today that will create a sustainable future which supports environmental quality, economic security and a quality of life for all; and

WHEREAS, the City Council has approved a landfill gas conversion project at the South Chollas landfill to create clean-burning fuel for city refuse collection vehicles, thereby demonstrating a closed-loop cycle;

WHEREAS, Environmental Services Department is committed to taking a leadership role in coordinating the San Diego Livable Community Initiative, which lists as priorities advocating resource-efficient buildings, catalyzing the use of renewable energy and clean fuels, and offering community outreach and education; and

WHEREAS, the Livable Community Initiative Partnership Agreement between the city of San Diego and the Department of Energy's Office of Energy Efficiency and Renewable Energy is a commitment to work together to advance the mutual benefit of increased energy reliability through distributed energy projects and environmental quality through the use of renewable energy;

WHEREAS, the Department of Energy has "jump-started" the city's opportunities to beneficially use closed landfill sites through the "Brightfield[CM] Initiative" by funding and completing a feasibility study on behalf of the city exploring the options for solar energy generation at the Miramar, South Chollas and Arizona Street landfills;

BE IT PROCLAIMED, by the city of San Diego, that this Mayor, for and on behalf of the people of San Diego, does hereby recognize and appreciate the assistance of the Department of Energy, and hereby proclaims November 30, 2000 as "RENEWABLE ENERGY DAY" in the city of San Diego.

Embedded Secure Document

The file *http://www.eere.energy.gov/brightfields/pdfs/doe_grant.pdf* is a secure document that has been embedded in this document. Double click the pushpin to view.

New Home of Spire Solar Chicago

Built on a former Brownfields site in Chicago, the new Midwest Center for Green Technology is home to Spire Solar Chicago. Spire Corporation (a solar equipment manufacturer) is helping the city of Chicago develop a new market for photovoltaic (PV) technologies.

Artist's rendering of the Midwest Center for Green Technology. ©2000 Farr Associates Architecture and Urban Design, Chicago.

Press Releases, Announcements, and Speeches

Press Releases

11/19/01 — (PDF 13 KB) City of Brockton, MA Receives US Department of Energy Brightfields Grant

7/26/01 — Spire Corporation to Help Brockton, MA, Develop Solar Energy Generating Facility

8/4/99 — Chicago Developing New Center for "Green" Industry: Solar Plant Will Turn West Side Brownfield into "Brightfield™"

Announcements

1/23/01 — Spire Solar Chicago Helps Power Nature Museum

11/30/00 — Former San Diego Mayor Susan Golding's Proclamation of Renewable Energy Day

Speeches

9/24/01 — Remarks by David Garman, Assistant Secretary, Office of Energy Efficiency and Renewable Energy, at the Brownfields 2001 conference (Chicago, IL)

Remarks of David Garman, Assistant Secretary, Energy Efficiency and Renewable Energy

Brownfields 2001 Conference in Chicago, IL
September 24, 2001

Reflecting on the events of September 11, several of our speakers have mentioned the need to "carry on."

While that's true, I'd like to suggest some ways we can "fight back."

The nation has come together with a common purpose in a manner not seen since World War II.

On the home front during World War II there was a great emphasis on saving energy and fuel. Folks learned how to reuse things. Kids collected scrap and even the tin foil from the cigarette packages to be recycled and reused. Little was wasted, and everyone pitched in. As a consequence, everyone took some measure of personal responsibility to share in the struggle against Nazism and Fascism.

And the moment that happened, the outcome of the war was inevitable.

Today many Americans are longing for something to do to join in the new struggle against the architects of terror.

Many have volunteered their services, donated blood, and given money... But many more are still seeking ways they might help. And there is something more everyone can do.

It is clear that our reliance on imported oil—56% of the oil we use—has complicated our response to the terrorist attack.

There is also little doubt that some of the dollars we have exported in exchange for

foreign oil have found their way into the hands of terrorists and would-be terrorists. The last time I checked, we were importing over 600,000 barrels of oil each day from Iraq.

Given the impact of these attacks on our economy, it also makes sense to keep our dollars working here at home rather than exporting them overseas to pay for oil.

So like we did during World War II, is it important that everyone pitch in to save energy, particularly imported oil.

Now, I know I am preaching to the choir.

Your efforts to promote brownfields redevelopment demonstrate your determination to preserve resources and revitalize communities.

That's good for the environment and good for the economy.

So in the current context of our national struggle, let's just say that you were well ahead of your time.

Thank you for your efforts, past and future.

Today I want to briefly talk about the nexus between energy and brownfields.

Brownfields sites can provide a spectacular location for new energy activities that revitalize communities, help protect the environment, and enhance our energy security and reliability.

The President's National Energy Plan directs us to work with local and state governments to promote the use of well designed combined heat and power and other clean power generation at brownfields sites, consistent with local communities' interests.

We at the Department of Energy see brownfields as a strategic opportunity for local and state governments and the private sector to maximize the nation's assets.

We envision a future where Distributed Energy Resources are located at brownfields and landfill sites in order to improve energy security and reliability.

> Many provide an excellent opportunity for on-site power generation, better known as "distributed generation".
>
> The benefit of distributed generation is that new clean energy technologies

(including photovoltaics and fuel cells) can generate power on-site; this power can either be consumed by the power producer or can be sold back to the grid.

Distributed generation at many locations around the grid increases power reliability and quality while reducing the strain on the electricity transmission system.

It also makes our electricity infrastructure less vulnerable to terrorist attack, both by distributing the generation and diversifying the generation fuels.

So if you're engaged in this effort, guess what? You are also engaged in our national effort to fight terrorism.

We also envision a future where Combined Heat and Power (CHP) systems are one of the first options considered when developing brownfield sites.

Industrial facilities often generate their own power on-site and have large thermal loads. DOE has helped industry create efficient CHP systems that capture the heat generated during the production of this power.

In fact, CHP systems can be between 65% and 85% efficient… the typical central power plant is 34% efficient.

The increased efficiency of CHP systems over the typical system means that energy use and emissions are reduced.

This is especially important in the urban non-attainment areas where you find many brownfields.

One way to revitalize brownfield sites through CHP is to set up district energy systems on-site that can supply heating and cooling to the surrounding neighborhoods.

This can help attract new industries and new jobs.

The Department of Energy has partnered with the Northeast-Midwest Institute, the City of Chicago, and CANMET Energy Centre to assess the potential for CHP at the West Pullman brownfield site on the south side.

We believe CHP can increase overall system efficiency thus saving our nation money and resources.

So if you're also engaged in this effort, guess what? You are engaged in our national effort to fight terrorism.

Finally, we envision a future where Brightfields, or, renewable energy technology power plants located on brownfield sites, are developed across the country.

Local governments and the private sector have shown a keen interest in using brownfield sites to locate photovoltaic panels to generate clean, renewable energy.

These redeveloped sites, known as Brightfields, will add clean electricity to the grid, attract investment dollars, and provide local jobs at these underutilized sites.

Since 1999, DOE has helped five communities across the country to both plan and develop Brightfields pilot projects.

San Diego, for example, is a market where the price of electricity is volatile, where there is minimal land available for redevelopment, and where air quality concerns constrain new power project development.

The San Diego City government has decided to address these needs by converting their landfill sites into Brightfields for power generation - an activity they find economically and environmentally attractive.

Brightfields can also provide jobs, as you can personally witness on a site visit to the Chicago Brightfield activity tomorrow from 10:15 AM - 12:15 PM.

The Chicago Department of the Environment, in partnership with Chicago Solar and ComED, have developed a solar photovoltaic technology-manufacturing center at this site and created more than 50 local jobs.

The City of Chicago has followed up on this project by making a commitment to purchase 83 MW of "green" power by 2005, part of which will be met with purchases from the local factory to provide clean power to schools, public libraries, and other municipal buildings.

So if you're part of this effort, guess what? You are also engaged in our national effort to fight terrorism.

The Department of Energy will continue to partner with other federal agencies to share information and expertise with the brownfields community, local and state governments, non-profit organizations, and the private sector.

My office, the Office of Energy Efficiency and Renewable Energy, maintains a variety of databases and Web sites, such as the Energy Efficiency and Renewable Energy

Clearinghouse, that can be very useful to you.

Another valuable Web site that can help you to understand the incentives available for the purchase of renewable energy is the Database of State Incentives for Renewable Energy. This Web site has information on local government and community programs, as well as information on federal incentives.

As you revitalize brownfield sites I urge you to consider the possibilities to promote CHP, distributed and renewable energy at those sites.

And as much sense as that made prior to September 11 … it makes even more sense today because of the way it benefits our nation as we work to subdue global terrorism.

In closing, I'm reminded of the story of the custodian sweeping the floor of a NASA building in 1967. When asked what he was doing, he stopped his sweeping and gazed at his questioner, somewhat incredulous at the question.

He answered: "Why, I'm helping to put a man on the moon."

And he was right. He may have just been sweeping the floor, but his view of the "big picture" was crystal clear.

Today, the "big picture" requires that we put all our assets to their highest and best use.

You and I may not be piloting combat jets, or compiling intelligence reports, but we are part of an effort that will save energy by improving efficiency, that will revitalize our economy, and that will make our electricity system more robust and less vulnerable.

And in so doing, we are something like the NASA custodian or the kids collecting scrap in World War II.

All our efforts to revitalize communities, reuse land, and promote distributed energy were already worth doing for their own sake, but as a part of something much larger, they are absolutely essential.

Thank you for your efforts in our cause.

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